

A Best-Practices Guide to Open-Air Poultry Slaughter

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Small-scale producers in Oregon who want to process and sell poultry have the option of slaughtering their birds in an open-air setting if they meet certain conditions. The Oregon Department of Agriculture’s Farm Direct Poultry Law stipulates that:

- The farmer processes no more than 1,000 birds per year.
- The birds were raised by the farmer.
- The processed birds are sold direct to household consumers at the farm itself.

Farms that qualify to raise, process and sell poultry under this law are exempt from many of the requirements that state-licensed poultry processing facilities must follow. The most notable difference is that state-licensed facilities must be securely enclosed with four solid walls, a roof and a floor to protect cleaned poultry carcasses from outside sources of contamination. The Farm Direct Poultry Law does not require this level of construction, and open-air processing is allowed.

Yet, it is still essential for poultry processors of any size to operate in a safe, sanitary and environmentally sound manner.

This guide will help you with that. Some of this advice — like washing your hands — will sound like common sense. However, the consequences of carelessness can be high: contaminated poultry, sick consumers, penalties for environmental damage, personal and business liability, and more. Other suggestions may be new to you. Take time to come up with a plan that you can and will carry out every day you process poultry.

This guide is not a manual for how to slaughter and process poultry, nor does it tell you what equipment you need or how to market your poultry. See page 7 for useful resources on those topics.



Photo: Lynn Ketchum, © Oregon State University
Pastured poultry at Red Bird Acres in Corvallis.

Processing site

The processing site refers to the whole area where slaughter and processing takes place, including the holding pens for live birds. Bottom line: It should be clean, well-drained, and free of trash and pests.

The Oregon rules require that you reasonably protect your slaughter site, equipment, supplies, poultry and poultry carcasses from potential contaminants. These include dust, mud, pests or any other source of contamination. You can do this with a combination of

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tarps, canopies and floor mats. A clean, grassy area can work, but make sure it is pesticide-free to avoid potential pesticide contamination of finished poultry.

Some farms have found a concrete pad to be useful, because it is easier to clean than grass or bare ground. It does not have to be unduly expensive. One Benton County poultry farmer put in an 8-foot-by-22-foot concrete pad himself for \$450 in materials in 2012.

To prevent contamination of clean carcasses, create distinct areas within your processing site and keep them clearly separated. These include a “dirty” area for slaughter, bleed-out, scalding and plucking; an area for evisceration; and a clean area for chill tanks and final packaging. Regularly inspect your processing site for trash, blood, feathers, fecal material or any other potential sources of contamination. If you find anything, dispose of it immediately.

Other areas to keep clean, trash-free and pest-free:

- Buildings or sheds where you store processing equipment and supplies.
- Coolers and freezers where processed birds are stored.
- Toilets, hand-washing stations and other personal hygiene areas.

Pest control

- Rodents: While most farms have them, keep them out of your processing site. Search out and get rid of any likely places where rodents could live and breed.
- Strictly exclude wild birds and domestic and wild animals from the processing site.
- Exclude insects. If tarps and canopies aren't enough, spray or bait. Ensure any sprays or baits you use are approved for food-processing areas. Start processing early in the day before insects are a problem; use a fan to blow insects out of the processing area.
- Keep trash cans covered.

Remember: ODA has the authority to inspect your site at any time, with no advance warning. *Be ready.*

Water

Poultry processing requires a supply of potable water sufficient for processing, chilling, cleaning, sanitizing and personal hygiene. One small farm estimates it uses 1 to 2 gallons of water per bird, just for processing. Farmers need additional water for the other uses.

Sources of potable water include municipal water, private wells that are properly managed and regularly tested, closed portable water containers filled with potable water, and bottled drinking water.

Provide hot water (112° F minimum) for personal



Photo: Lauren Gwin, © Oregon State University
OSU on-farm poultry processing demonstration, Corvallis.

hygiene, including all hand-washing, and for cleaning equipment.

Set up a hand-washing station. A water cooler suitable for hot water, with a toggle-style on/off spigot, works well. Provide hand soap in a pump dispenser. Place a 5-gallon bucket below to collect the grey water.

Prevent backflow that could contaminate your potable water supply. Leave an air gap between the hose or fill pipe and the bucket, tank or other container you are filling. The air gap must be at least twice the diameter of the fill hose or pipe. If you have a plumbed outdoor sink with hoses suspended over the sink, make sure the hose ends above the top of the sink.

Use food-grade hoses for all water that will come in contact with the poultry. Food-grade materials will not transfer noxious or toxic substances into the food or water they hold. If you aren't sure if a hose is food grade, check the label or ask the manufacturer if it is FDA-approved as safe for food use.

Make sure your ice source is potable or food grade. Make sure you have enough ice when you start your slaughter day. Processing on a hot summer day might require twice the amount of ice needed on a cooler day. If you have extra clean ice, you can bag some for your customers to keep their poultry cold in transit.

Personal hygiene

The following practices may sound obvious — so obvious they may be overlooked. Too many foodborne illness outbreaks are caused by the personal hygiene mistakes of processing personnel.

- Don't smoke, eat, drink, or chew gum or tobacco while actively slaughtering, preparing or handling poultry.
- Don't allow anyone with a cold, the flu or any communicable disease onto the processing site. Bar anyone with open sores or infected cuts on their hands, and anyone who has diarrhea or who has been vomiting.
- Wear clean and appropriate clothing. Poultry processing is a dirty business; if clothing becomes too soiled to process safely and sanitarily, change it.
- Consider wearing a full-length, vinyl apron to add extra protection from the poultry carcass. Wear the apron on the "clean" side of your processing site only — never in the bathroom. Don't walk between the dirty side and the clean side in the same apron.
- Remove all hand jewelry that cannot be adequately sanitized when carcasses are handled. Or, wear gloves that are disposable or that can be completely cleaned and sanitized.
- Tie long hair back or wear a hat. Processors with long beards may consider a beard net.

Cleaning vs. sanitizing

Cleaning and sanitizing are not the same thing. Cleaning is the removal of filth, often by physical removal and detergents. Sanitizing is a chemical treatment that kills microorganisms such as salmonella or campylobacter. Most sanitizing treatments are ineffective on dirty surfaces, especially when there is organic material (e.g., carcass residue, bloody water). The presence of residual detergent can also make sanitizers less effective. For these reasons, things must be cleaned and rinsed with water before they can be effectively sanitized.

Be prepared

At the beginning of the slaughter day, prepare dedicated buckets in your slaughter area for holding wipe-down cloths. This will streamline tool and equipment cleanup during slaughter.

Choose an appropriate sanitizer for your equipment and slaughter area. Use an EPA-approved sanitizer for food-contact surfaces. Find a full list of EPA-approved sanitizers in the Code of Federal Regulations, Section



Photo: Mike Badger

Mobile poultry slaughter trailer.

21, Part 178.1010, www.gpo.gov/fdsys/pkg/CFR-2002-title21-vol3/pdf/CFR-2002-title21-vol3-part178.pdf.

Chlorine (mixed at 50–200ppm) is the most commonly used sanitizer and is easily available. You can make a 100 ppm chlorine sanitizer by adding one tablespoon of household bleach to one gallon of room temperature water. However, chlorine does have disadvantages. Its efficacy is drastically reduced in the presence of organic material, and it may damage stainless-steel surfaces. Iodine, quaternary ammonium or a mixture of acetic acid and hydrogen peroxide are less damaging to equipment surfaces.

Regardless of the sanitizer used, be careful not to use too much. You can purchase a chlorine or quaternary ammonium sanitizer test kit at a local restaurant supply store for a few dollars, to make sure you use the right amount and not contaminate the poultry carcass.

Always follow the label directions precisely when you mix a sanitizing solution, and confirm that the sanitizer is food grade. Clorox Regular Bleach is food grade, but Clorox Splash-Less Liquid Gel Bleach is not.

Contact time is also an important factor for effective sanitization. Again, follow the label.

Organic matter reduces the efficacy of a sanitizing solution. If the solution is no longer clear, the sanitizer is no longer working. Make up the solution with room temperature water and change the sanitizing water every one to two hours during slaughter.

Maintain and store it securely

Keep all your processing equipment, knives and other tools in good condition. The processing will be more efficient, and the tools will be easier to clean and sanitize. After each processing day, store your cleaned and sanitized equipment, knives, tools, and cleaning and sanitizing supplies in clean, secure storage areas.

Pathogen control

Salmonella and *campylobacter* are the primary pathogens of concern for poultry operations of any scale. Unfortunately, small flocks and processing runs are not immune to contamination. In 2011, poultry processed by “exempt” facilities and sold at farmers markets in Pennsylvania and Washington, D.C., made national headlines when testing positive for *salmonella*. As sales of local, small-scale poultry continue to grow, production and processing practices will come under increasing scrutiny. Processors must do their due diligence to protect both consumers and their farms from risks of foodborne illness. You can minimize risk by taking practical steps to prevent contamination during slaughter and to prevent these bacteria from growing on carcasses after slaughter.

Production practices

Production practices have a big impact on whether broods are likely to be contaminated with *salmonella* or *campylobacter*. A recent study by Oregon State University found that of small poultry processing operations tested, 20% had a high prevalence of *salmonella* in finished carcasses.

Further studies attributed the high level of contamination to colonization during production. Birds that are colonized with *salmonella* or *campylobacter* are often perfectly healthy and appear no different from birds that are not colonized.

If you produce your own chickens, take care to create and maintain an environment that is easy to clean between broods. Ensure that your watering and feeding systems are not easily contaminated by feces.

Minimize exposure to other livestock or wildlife.

Slaughtering practices

Chicken slaughter is a dirty job that turns a live animal into meat. Inedible and potentially contaminated parts of the carcass must be separated from edible, typically uncontaminated parts. Feces and eviscera can harbor high levels of *salmonella* and *campylobacter*.

Contamination occurs when the poultry carcass comes in contact with the digestive or fecal materials of an infected bird. To prevent contamination, do everything possible to keep the finished carcass from contacting these parts. Even a small speck of feces left on a carcass can spread *salmonella* and *campylobacter* to other carcasses.

Crops and livers may also be contaminated with *salmonella* and *campylobacter*. Harvest livers with care and refrigerate them as quickly as possible to prevent bacterial growth.

Prevent contamination and cross-contamination

- Withhold feed from poultry eight to 12 hours before slaughter, but make sure they have access to clean water. This will minimize the potential for defecation during slaughter.
- Evaluate live birds for signs of illness. Do not process diseased poultry.
- Brush dirt or foreign matter from birds before slaughter if necessary. Process the dirtier birds at the end of the day.
- Clean, rinse and sanitize all contact surfaces, equipment, utensils and coolers at the beginning of the slaughter day. Pay extra attention to cleaning and sanitizing the plucker, as it is likely to be contaminated.
- Use separate tools for “clean” vs. “dirty” tasks. Do not use the same knife for bleeding (dirty) as for cutting carcass parts (clean).
- Minimize traffic flow from dirty areas to clean areas. Emphasize regular hand-washing, particularly when moving between tasks.
- Clean equipment and tools at least every four hours.
- Clean and sanitize visibly soiled tools before you continue to use them.
- Start with clean water in the scalding and chill tanks. Maintain appropriate temperatures in each area.
- Consider using an antimicrobial spray (see below).
- Before placing each carcass into the chill tank, inspect it for feces, eviscera or anything that could cause contamination. Practice zero tolerance: Trim away anything you find and inspect the carcass again.
- If you suspect contamination has occurred in the chill tank, change the chill water immediately, and rerinse all chilled carcasses at risk.
- Change the chill water at least once per day or per every 50 birds slaughtered, whichever is more often. Change the water whenever noticeable organic matter (blood, etc.) accumulates in the chill tank.
- After packaging the poultry, clean and sanitize everything.

Antimicrobial spray step

A 2% lactic acid solution spray is highly effective at preventing pathogen growth. Spray each carcass and allow it to hang briefly before placing in the chill tank. Research conducted at Washington State University found that, when done correctly, this was effective at controlling pathogen regrowth and can vastly reduce dangerous pathogens on the birds you sell.

Other effective antimicrobials include buffered lactic acid, citric acid, peracetic or peroxyacetic acid,

Antimicrobial solutions

Antimicrobial	Approved uses	Maximum concentration <i>The labels will tell you how to mix it</i>
Peroxyacetic acid	Acidifier in scald tanks, poultry process water for spraying, washing, rinsing, dipping, chilling or low-temperature immersion of carcasses, parts, trim and organs	2,000 ppm
Acidified sodium chlorite	Poultry carcasses parts, trim, organs and ground or finally chopped poultry products	500–1,000 ppm in combination with GRAS acid to achieve pH of 2.3–2.9
Strong/weak acid	Poultry carcasses, parts, trim and organs	pH of 1.0–2.0
Cetylpyridinium chloride	Poultry carcasses, giblets, parts	0.8%
Chlorine	Poultry carcasses, chiller water, reprocessing, giblets	50 ppm

Table adapted from: Antimicrobial Use in Poultry Processing by Dianna Bourassa, *Food Safety Magazine*, www.foodsafetymagazine.com/magazine-archive1/december-2017/january-2018/antimicrobial-use-in-poultry-processing/

acidified sodium chlorite, acidified hypochlorite and cetylpyridinium chloride, as well as chlorine.

Chlorine is the most widely used carcass sanitizer in the United States. Chlorine is not effective when there is a lot of organic matter, or the pH of the rinse/dip water is above 6.5.

Other proprietary carcass washes lower the pH of the rinse/dip water and have been shown effective in reducing pathogens. One example is PoultrypHresh, made by CMS Technologies.

Using antimicrobials

- Following label directions and using potable water, mix a gallon of a 2% lactic acid solution. Each gallon of solution will be sufficient for a 50-bird run.
- Apply solution with a spray bottle or pump sprayer with all plastic or all stainless-steel parts. Acetic solutions will corrode brass.
- Thoroughly wet each cleaned carcass inside and outside with the solution. Hang for three minutes if using lactic acid; follow label directions for other antimicrobials and place in the chill tank.
- Each bird requires a little more than 2 ounces of solution. A gallon of solution (128 ounces) will treat 50–60 birds.

Preventing pathogen growth on cleaned carcasses

- Chill cleaned carcasses to 40 °F within the following time periods after entering the chill tank: four hours for a 4-pound bird; six hours for a 4- to 8-lb. bird;

eight hours for a bird greater than 8 pounds. These time periods are USDA requirements.

- Store chilled, packaged poultry at 40 degrees Fahrenheit or lower.

Keep track so you know

- Check the temperature of the chill tank regularly during processing to ensure the water remains between 33 and 40 degrees Fahrenheit.
- Measure the internal temperature of two or three birds during the processing period to ensure chilling to 40 degrees Fahrenheit occurs within four hours.
- Remember: The larger the bird, the longer it will take to cool.

Check the chill tank water temperature with a thermometer that can be calibrated. These thermometers are readily available and inexpensive.

How to calibrate

Start with a 12-ounce cup of ice, add a little water, and insert the thermometer.

Stir the ice for one minute. If the thermometer reads 32 °F, it is well calibrated. If it does not, adjust the thermometer according to the manufacturer's instructions until it reads 32 degrees Fahrenheit when in the ice water for one minute.

Create a log to record thermometer calibrations. Calibrate your thermometer often enough to be confident that it is accurate. If you drop it, drop something on it, or otherwise abuse it, calibrate it.

Sample record sheets

Cleaning log

Slaughter date	Area cleaned	Time	Cleaning chemicals	Notes

Temperature records

Slaughter date	Quantity	Type of poultry	Chill tank temperature	Times you changed chill tank water	Internal cavity temperature	Cooler or freezer temperature	Thermometer calibration date

Sales records

Date of sale	Customer name	Address	Type of poultry	Quantity	Slaughter date

Measure the internal cavity temperature of poultry carcasses with a thermal probe that can be calibrated. Calibrate it according to the manufacturer’s instructions.

Packaging

Food-grade plastic bags are the typical packaging for finished poultry. Double bag or make sure your bags are thick enough not to be punctured by ice’s rough edges in the cooler. Shrink wrapping is also an option and produces a cleaner presentation. Food-grade plastic will not transfer noxious or toxic substances into the food it is holding. If you aren’t sure whether packaging is food grade, check the label or ask the manufacturer if the product is FDA-approved as safe for food use.

See ODA’s *Farm Direct Poultry Law Guidance* for full labeling rules: www.oregon.gov/ODA/shared/Documents/Publications/FoodSafety/FarmDirectPoultry.pdf

Monitoring and recordkeeping

Sanitation records

ODA requires that you make and retain the following sanitation records for at least two years after the final data entry:

- Daily cleaning logs for each slaughter date.

- Washing and cleaning logs for all utensils, cutting boards and any other items used during slaughter and processing.
- Lists of chemicals used in sanitation of the facility.

Simple cleaning log

- A list of items or areas to be cleaned and sanitized.
- A space to note the date and time when each was cleaned and sanitized.
- A larger space for your own notes. (For example, if a particular piece of equipment has a difficult place to clean, you would list the problem and what you’re doing about it.).

Temperature records

As discussed above, we recommend that you monitor and record the following:

- Chill tank temperature once per hour during the slaughter day.
- Times you changed the chill tank water during the slaughter day.
- Internal cavity temperature of two to three birds for each 50 birds slaughtered.
- Cooler or freezer temperature once per day when the equipment is used for poultry storage.

- Date of thermometer or thermal probe calibration.

Sales records

Both ODA and USDA require that you keep the following records:

- Evidence that you raised the poultry since the poultry was 2 weeks of age or younger.
- The year-to-date cumulative total of each poultry species slaughtered (e.g., how many chickens, how many turkeys) and total quantity of poultry slaughtered.
- Slaughter dates.
- Sales information including:
 - Purchaser's name and address.
 - Species and quantity of poultry sold.
 - Date of the poultry's slaughter and the date of sale.
 - Address of the poultry business.

Wastewater and offal disposal

You must have a proper disposal plan for waste water and offal: eviscera (guts), blood, heads/feet and feathers. You may compost up to 20 tons (40,000 pounds) of solid and liquid waste (blood, offal, feathers) on-farm without a permit from any agency. This does not include land application of processing wastes (such as by sprinkler, drain line or bucket). You must ensure that the composting process won't contaminate surface or ground water.

Applying any waste water directly to the surface of the land — by hose, bucket or any other means — may require a permit from ODA's Natural Resources Division. Call NRD at 503-986-4700 for information and specific permit requirements.

Several resources provide technical guidance on composting (see Resources, at right). The Oregon Department of Environmental Quality State regulates composting activities.

- DEQ fact sheets: www.oregon.gov/deq/mm/swpermits/Pages/Composting.aspx
 - DEQ permit information: www.oregon.gov/deq/mm/swpermits/Pages/Composting-Facilities.aspx
- ODA's Agricultural Water Quality Management Program rules prohibit you from discharging any waste water — even the waste water from processing as little as one chicken — into surface water or groundwater.

Zoning

Oregon regulations on poultry processing do not exempt producers from zoning laws and rules. However, in 2013, the Oregon Legislature added the slaughtering, processing and selling of up to 1,000 poultry as an outright permitted nonfarm use, subject to specified

limits, in areas zoned for exclusive farm use (HB2393). It is still prudent to investigate potential limitations in your location before starting a poultry business.

Resources

Animal Welfare Approved Guidelines for Poultry Slaughter Facilities, accessed at agreenerworld.org/wp-content/uploads/2018/05/AWA-Slaughter-Guidelines-for-Poultry-2017-v2.pdf

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Oregon Retail Food Code 4-602.11(C) Equipment Food-Contact Surfaces and Utensils. Accessed at www.oregon.gov/ODA/shared/Documents/Publications/FoodSafety/FoodCode.pdf

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Youngberg, Nels, Mineral Springs Poultry, Willamina, Oregon. A one-hour how-to video on processing. Only available on CD; call to order: 503-876-8231.

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